

DIGILENT CHOOSES AMD ZYNQ™ AND SPARTAN™ DEVICES FOR ITS NEXT-GENERATION TEST & MEASUREMENT INSTRUMENTS

CUSTOMER



INDUSTRY

Test and measurement tools for electronics

CHALLENGES

Test and measurement devices are becoming more complex, requiring higher resolution and sampling rates, which necessitates increased memory

SOLUTION

Digilent's AD3 takes the previous AD2 product and enhances it by upgrading the FPGA to an AMD Spartan 7 to give the product more flexibility and compute power, ultimately leading to the ability to keep up with constantly changing applications. The ADP2230 has the same foundation as the AD3, but adds extra deep memory and is enabled by the AMD Zynq 7020 adaptive SoC.

RESULTS

Digilent's entire line of test and measurement products is based on adaptability and cost-optimized solutions, like AMD Spartan™ 7 FPGA, AMD Artix™ 7 FPGA, and AMD Zynq™ 7000 FPGA, that enabled Digilent to build products for a cost-sensitive audience, like academia.

AMD TECHNOLOGY AT A GLANCE

AMD Spartan™ 7 FPGA, AMD Artix™ 7 FPGA, and AMD Zynq™ 7000 FPGA



Digilent's Analog Discovery 3 and ADP2230 Devices Use AMD Adaptive Computing to Combine an Oscilloscope, Waveform Generator, Logic Analyzer, Variable Power Supply, and More into a Single Product

Digilent makes development boards and kits, along with a variety of test and measurement tools that provide professional-level analytics to engineers, researchers, and students with the flexibility of a portable instrument. A long-time user of AMD FPGA and adaptive SoC technology, the company once again turned to these AMD devices, recently, to create two new powerful test and measurement instruments that deliver higher performance, lower cost, and greater flexibility to its customers.

CHALLENGE

Applications like test and measurement equipment are becoming more complex, require higher resolution and, as a result need higher sampling rates and increased memory. The latter means more data needs to be sent through and analyzed on the Digilent devices, which in turn require improved hardware resources.

There are other handheld oscilloscopes in the market that you can plug into a computer. What sets Digilent apart is their WaveForms software. It gives their customers the ability to run several instruments/test devices simultaneously, which requires parallel processing capabilities. With the free WaveForms software, users can view and capture complex data, perform spectral and network analysis, and quickly retrieve large amounts of data.

SOLUTION

The Analog Discovery 3 (AD3) is a portable USB-powered multi-function test and measurement device that can be a digital oscilloscope, logic analyzer, waveform generator, pattern generator, and more. Using the flexible WaveForms software (supported by Windows, Mac, and Linux), the Analog Discovery 3 can be used in the lab, in the field, or at home.



The AD3 is enabled by AMD and has been upgraded from an AMD Spartan 6 FPGA to an AMD Spartan 7. This allowed Digilent to free up compute power for deeper memory, which in turn has improved the device. It can now switch USB connectors and add more instruments to do more simultaneous testing with deeper memory. The amount of samples it can store in real time tests has doubled from 16k bits of data per channel to 32k bits per channel. This means that Digilent customers can get more precise measurements, and for a longer period of time, without sacrificing the testing speed.

Digilent's AD3 device takes the previous AD2 product and enhances it with incremental improvements, by upgrading the FPGA to give the product more flexibility and compute power, and the ability to keep up with constantly changing applications.

"The AD3's deeper memory and bigger buffer size opens it up for bigger applications, including IoT and Industry 4.0 applications -- anything that needs to be tested or debugged," said David Horn, marketing manager at Digilent. Digilent also changed the AD3 to a USB-C connector and updated the product design. It is 99% backward compatible with their previous-generation product and offers comprehensive software and documentation. It's being used in more than 300 universities across North America.

Digilent also recently introduced the ADP2230 (Analog Discovery Pro) oscilloscope, which has an AMD Zynq™ adaptive SoC inside. The ADP2230 has close to 4,000x greater buffer size than the Analog Discovery 3 and is designed for more professional-level applications.



The Analog Discovery Pro (ADP) 2230 is multiple products in one, including a mixed-signal USB oscilloscope, waveform generator, logic analyzer, and variable power supply targeting professional engineers. With the same basic foundation as the AD3, the ADP is based on the AMD Zynq 7020 adaptive SoC and adds extra deep memory.

The ADP2230 is a mixed-signal oscilloscope (MSO) designed for professional engineers. It features analog inputs, analog output, and digital I/O, with deep memory buffers all operating at up to 125 MS/s. Users can both receive and generate digital signals to test and analyze data from various devices while simultaneously powering those systems with its robust power supply.

Comparing the AD3 and the ADP2230, one of the main differences between these devices is the bandwidth. For the AD3, connecting through the fly wires or MTE connector you get about 9 MHz of bandwidth, but using the BNC adapter it goes up to 30 MHz of bandwidth. When you use the ADP2230, the bandwidth reaches 50 MHz. The biggest differentiation offered by the ADP2230 is the sample buffer size, 120 Mega sample size buffer for each channel, whereas the AD3 offers only 32,000 sample buffer for each channel. All of this is enabled by the AMD FPGA and Adaptive SoC technology.

RESULT

Digilent's entire line of test and measurement products is based on adaptability," Horn said. "Low-cost solutions like AMD Spartan™ 7 FPGA and AMD Artix™ 7 FPGA, and to a lesser extent, AMD Zynq™ 7000 FPGA, are what made the company what it is today. The engineers working at Digilent were able to use these low-cost devices to build low-cost products for a cost-sensitive audience, like academia. The very existence of the AMD environment is what helped Digilent grow and be successful."

Horn added, "Digilent tries, as a company, to keep making the barrier to engineering lower, and we are able to do that with AMD silicon. For instance, the parallel processing capability of the AMD Zynq adaptive SoC enables the ADP2230 to run 13 different instruments/test devices at the same time. As a result, it can easily switch from waveform generator to pattern generator to logic analyzer. The crux of Digilent's entire platform is based on this ability to adapt that is built into AMD chips."

ABOUT DIGILENT

Digilent, now part of Emerson, crafts hardware and software solutions that empower engineers, researchers, educators and scientists to design and test with unparalleled flexibility. Its customizable solutions cater to both seasoned professionals and emerging engineers, accelerating development while maintaining a low barrier to entry. For more information, please visit the [Digilent](#) website.

ABOUT AMD COST-OPTIMIZED PORTFOLIO

The AMD Cost-Optimized Portfolio includes various FPGAs such as AMD Spartan™ and Artix™ families, select adaptive SoCs like the AMD Zynq™ families, and spans multiple process nodes from 45 nm to 16 nm. For more information, please visit the [AMD Cost-Optimized Portfolio](#) page.

ABOUT AMD

For more than 50 years, AMD has driven innovation in high-performance computing, graphics, and visualization technologies. Billions of people, leading Fortune 500 businesses, and cutting-edge scientific research institutions around the world rely on AMD technology daily to improve how they live, work, and play. AMD employees are focused on building leadership, high-performance, and adaptive products that push the boundaries of what is possible. For more information about how AMD is **enabling today and inspiring tomorrow**, visit the [AMD \(NASDAQ: AMD\) website](#), [blog](#), [LinkedIn](#), and [Twitter](#) pages